



# Exploiting Technical Opportunities to Capture Advanced Capabilities for Our Soldiers

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**U**niversity Affiliated Research Centers (UARCs) and University Centers (UCs) are designed to provide critical mass in research areas that meet Army and DOD future needs and anticipated combat requirements. The Army currently has four UARCs and one UC. UARCs are university-led collaborations between universities, industry and Army laboratories that conduct basic, applied and technology demonstration research. The universities, considered at the forefront of science and innovation in a specific research area, provide dedicated facilities and share space with Army and industrial participants. The industrial partners provide competence in related technologies, expertise in transitioning technologies from laboratories to markets and cost sharing. The emphasis for each UARC is to conduct research where breakthroughs are likely to enable revolutionary capabilities for our warfighters.

The UARCs/UCs work collaboratively with the Army to integrate mature technology into weapon, intelligence and communication systems to address Soldiers' short-term needs. Here, SGT Nicholas Fate, 1st Brigade Combat Team, 4th Infantry Division, provides perimeter security during a patrol near Mushahda, Iraq. (U.S. Navy photo by MC1 Michael Larsen, Combat Camera Pacific.)

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UCs are very similar to UARCs with the exception that they are funded by a co-operative agreement between the Army and the university to work collaboratively in a rapidly changing, mature technology area that is aligned with the short-term needs and timelines of major Army weapon, intelligence and communication systems. Industry partners join the center through co-operative agreements, when a

synergism between the center's technology and the production abilities of industry can be achieved.

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Army problems within their areas of competency.

- Organizing collaborative activities and promoting other linkages between Army/DOD, academia and industry.
- Assisting in technology transfer to industry.
- Fostering education in engineering and scientific disciplines that are especially relevant to Army/DOD needs.

The roles of UARCs and UCs include:

- Conducting research on assigned Army problems.
- Developing selected research prototype hardware, software and models.
- Conducting independent technical evaluations at the Army's request.
- Providing technical leadership in identifying and resolving

Management and oversight of each UARC is coordinated by an Army Executive Agent (EA). The EA provides oversight organization of each UARC with coordination of individual Technical Advisory Boards (TABs) that assess the UARC's technical progress and achievements annually. The UARC TABs report to an Executive Steering Board that addresses issues of Army policy with respect to all UARCs. Brief overviews of the four Army UARCs and the Flexible Display UC follow.

## The University of Texas-Austin Institute for Advanced Technology (IAT)



The IAT conducts basic research to advance the state-of-the-art in electrodynamics and hypervelocity physics as they relate to electromagnetic weapons. A detailed article on Page 20 of this edition by Army Program Manager Dr. Ed Schmidt and IAT Founding Director Dr. Harry Fair describes IAT's awesome capabilities and some of the technical challenges and breakthroughs their research team has encountered developing electromagnetic weapons.

## The University of Southern California (USC) Institute for Creative Technologies (ICT)



The ICT conducts basic and applied research in immersive technologies

to advance and maintain the state-of-the-art for human synthetic training experiences so compelling that participants will react as if they are real. The article on Page 24 details the impact that ICT training products have on today's and tomorrow's warfighters. Army Program Manager Dr. Jeff G. Wilkinson shares his insight about program direction and how immersive technologies are helping Soldiers learn,

train and prepare for operational environments.

## The Massachusetts Institute of Technology (MIT) Institute for Soldier Nanotechnologies (ISN)



The ISN's mission is to conduct basic research to advance the state-of-the-art in nanotechnologies as they relate to Soldier protection needs and requirements. The ISN's goal is to carry out fundamental research that is relevant to the Soldier and to transition it into more applied efforts. The article on

Page 28 by Army Program Manager Dr. Douglas Kiserow and ISN Director Dr. John Joannopoulos details the five strategic research areas where the ISN is actively implementing nanotechnology to affect revolutionary changes for warfighter survivability on the battlefield.

## The University of California-Santa Barbara Institute for Collaborative Biotechnologies (ICB)



The ICB provides national leadership in frontier research at

the interface between biotechnology and engineering to harness complex

Research being developed at USC's ICT will lead to immersive technologies that will advance human synthetic experiences from compelling training events so that Soldiers entering a new theater of operations will already feel like they know the culture, terrain and political/sociological nuances. Here, Soldiers from Alpha Co., 1st Battalion, 149th Infantry Regiment, patrol the Al Furat section of Baghdad, Iraq, on Aug. 20, 2007. (U.S. Army photo by SGT Jon Soucy.)





MIT's ISN is advancing the state-of-the-art in nanotechnology research and development related to Soldier protection needs and requirements. Here, Soldiers from Delta Co., 2nd Battalion, 3rd Brigade Combat Team, 25th Infantry Division, monitor vehicular and pedestrian traffic in and out of Riyadh, Iraq, last April. (U.S. Air Force photo by TSGT Maria J. Bare, 1st Combat Camera Squadron.)

biological mechanisms for the development of revolutionary approaches to advanced sensors — electronic, optical and magnetic materials — information processing and network control systems to enhance Army operational effectiveness. The ICB mission, organization and promising transitions are described in an article by ICB Army Program Manager Dr. Robert J. Kokoska and ICB Director Dr. Daniel E. Morse on Page 32.

### **The Arizona State University Flexible Display Center (FDC)**



The FDC facilitates the advancement of full-color flexible display technology while catalyzing the rapidly growing vibrant flexible display industry by contributing to and accelerating

development of human capital, tools, facilities and intellectual property. The FDC's principal technical goal is to develop material and manufacturing technology for high-performance, conformal and flexible displays that are ultra-rugged, lightweight, of reduced volume, low power and low cost. FDC Army Program Manager Dr. David Morton and FDC Director Dr. Gregory B. Raupp provide a detailed synopsis of the FDC's recent accomplishments in their article on Page 44.

Technical opportunities arise to advance major new capabilities through sustained, long-term multidisciplinary research efforts. To exploit these opportunities, the Army has created UARCs and a UC in the areas of hypervelocity lethality, simulation and training, Soldier protection, biologically inspired technologies and flexible displays. Each center brings together a

collection of specific basic research disciplines to focus on significant technical challenges involving a sustained effort over time. Collectively, the centers partner with industry and Army laboratories to transition new knowledge and novel technology concepts for further development. The centers also take advantage of knowledge and expertise that uniquely reside at Army laboratories and industry to further advance their research work. Graduate students led by senior scientists and engineers at these centers play a critical role in advancing new knowledge to support the Army mission.

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